



The University of Southern Queensland

Course Specification

Description: Time Series

Subject	Cat-Nbr	Class	Term	Mode	Units	Campus
STA	4304	10373	1, 2002	ONC	1.00	TWMB

Academic Group:	FOSCI
Academic Org:	FOS003
HECS Band:	2
ASCED Code:	010103

STAFFING

Examiner: Ron Addie
Moderator: Ashley Plank

RATIONALE

The analysis of discrete time series is performed for a variety of reasons: to identify the dominant interactions between the measured variables of a process; to model a process; to improve the control of a process; to forecast trends. Time series analysis has application to a wide variety of processes, including econometric, actuarial, commercial, industrial, agricultural, environmental, meteorological and medical processes.

SYNOPSIS

This course will consist of advanced studies in time series analysis for process identification and modelling. Topics will include: univariate and multivariate models of time series; forecasting algorithms; methods for model identification and parameter estimation; the spectral representation of a time series and non-linear forecasting methods.

OBJECTIVES

On completion of this course, students will be able to:

- understand the mathematical definition of a stationary time series (univariate and multivariate);
- identify the type of model to apply to a given time series by observing its autocovariance, partial autocovariance and periodogram;
- estimate the coefficients of a model of a time series with the assistance of a computer package and understand the mathematics on which the computer package is based.
- interpret diagnostic tests on the fit of a model to data;
- understand how to use a time series model for forecasting or prediction of the behaviour of a system;

- understand how to apply non-linear modelling methods such as radial basis functions and spline fitting;
- understand the concept of long-range dependent time series and their applications.

TOPICS

Description	Weighting (%)
1. Models of stationary multivariate time series	15.00
2. Forecasting formulae for multivariate time series	15.00
3. System identification and parameter estimation techniques	15.00
4. Diagnostic tests	15.00
5. Non-linear time series modelling and forecasting methods.	40.00

REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Box, G.E.P., Jenkins, G.M. & Reinsel, G.C 1994, *Time Series Analysis Forecasting and Control*, 3rd edition, Prentice Hall, New Jersey.

Brockwell, P.J. & Davis, R.A 1991, *Time Series: Theory & Methods*, 2nd edition, Springer-Verlag,

Hamilton, J.D 1994, *Time Series Analysis*, Princeton University Press, Princeton.

Weigend, A.S. & Gershenfeld, N.A. (eds.) 1994, *NATO Advanced Research Workshop on Comparative Time Series Analysis*, Addison Wesley,

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessment	40
Directed Study	40
Lectures	30
Private Study	40
Tutorial	15

ASSESSMENT DETAILS

Description	Marks Out of	Wtg(%)	Required	Due Date
ASSIGNMENT 1	20.00	20.00	Y	04 Mar 2002 (see note 1)
ASSIGNMENT 2	20.00	20.00	Y	04 Mar 2002 (see note 2)
EXAM - 3 HOUR CLOSED	60.00	60.00	Y	END S1 (see note 3)

NOTES:

1. Further details about the due dates are detailed in the assessment section of the Course Specifications.
2. Further details about the due dates are detailed in the assessment section of the Course Specifications.
3. Examination dates will be available during the Semester. Please refer to Examination timetable when published.

OTHER REQUIREMENTS

- 1 Attendance Requirements: It is the student's responsibility to actively participate in all classes scheduled for them, and to study all material provided to them or required to be accessed by them to maximize their chance of meeting the objectives of the course and to be informed of course-related activities and administration.
- 2 Requirements to Satisfactorily Complete Each Assessment Item: To satisfactorily complete each of the assignments, students must obtain at least half of the marks available for each assignment. To satisfactorily complete the examination in the course, students must obtain at least half of the marks available for each examination.
- 3 Minimum Requirements to Pass the Course: To be assured of a pass in this course, students must: (i) obtain an overall mark of at least 50%; and (ii) obtain at least 50% of the marks available in the examination(s); and (iii) obtain an overall mark of at least 50% in the assignments.
- 4 Grading: Final grades for students will be determined by the addition of the marks obtained in each assessment item, weighted as in the Assessment Details and by considering the students' level of achievement of the objectives of the course.
- 5 Supplementary and Deferred Examinations: Students who obtain an overall passing mark, but who do not perform satisfactorily in an examination, may, at the discretion of the examiner, be granted a supplementary examination. Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items. Any supplementary or deferred examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.
- 6 Assignments: The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the examiner. Students must retain a copy of each item submitted for assessment. This must be produced within five days if

required by the examiner. In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances. This policy may be found in the USQ Handbook, the Distance Education Guide and the Faculty of Sciences' Orientation Handbook for on-campus students. All students are advised to study and follow the guidelines associated with this policy. An assignment, submitted after the due date without an extension approved by the examiner, will attract a penalty of 10 percent of the assigned mark for each day (or part thereof) that the assignment is late.

- 7 Examinations: Closed Examination: Candidates are allowed to bring only writing and drawing instruments into the closed examination.
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